



Perceived Biosecurity Needs in Southeast Asia

***Chemical and Biological Arms Control Institute
Biosecurity in a Regional Context:
South and East Asia***

April 14, 2004

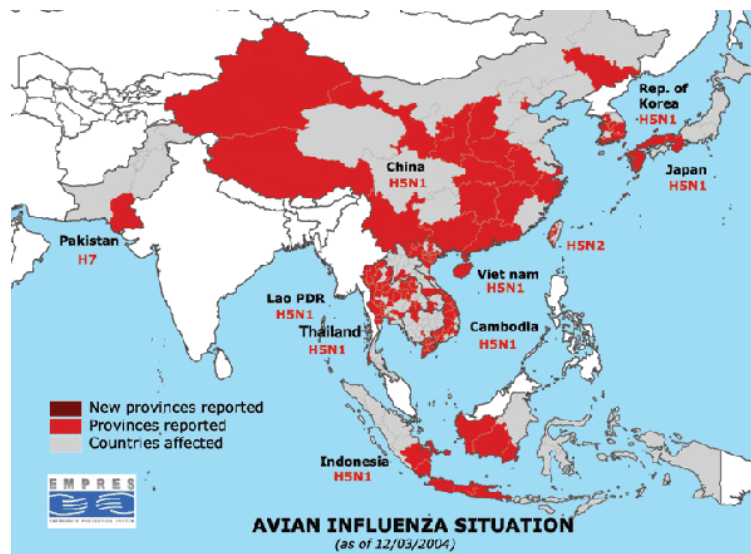
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SAND No. 2004-1402P

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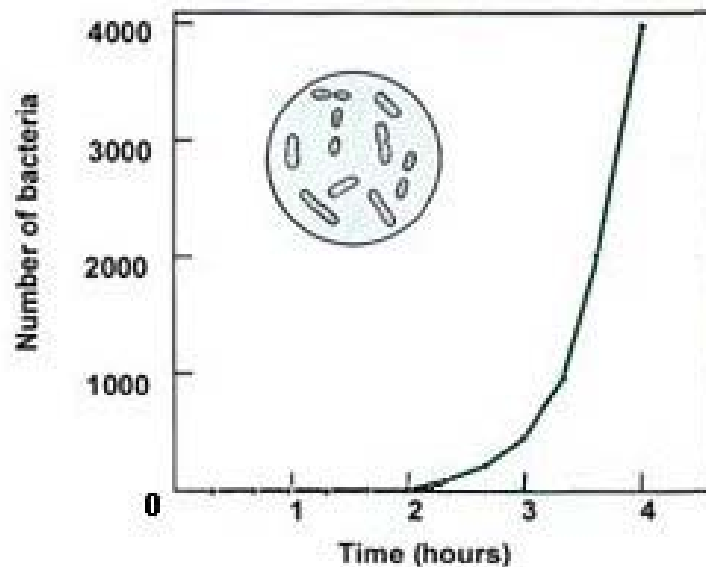
Introduction

- Infectious disease is an international concern
- Biological weapons can have far-reaching impact and inflict extensive damage on humans, animals, and crops
 - Recent natural outbreaks demonstrate the potential impact
 - ◆ SARS: China and beyond 2002-2003, 8000 infected and ~ 800 dead
 - ◆ Foot and mouth disease: UK 2001, \$8 billion dollars lost
 - ◆ Avian influenza: Asia 2004, \$500 million in recovery costs, over 100 million fowl culled
 - ◆ Nipah virus: Malaysia 1999, 1.1 million pigs slaughtered, 115 human deaths



Global Biosecurity is Critical

- Biosecurity measures in any one country are not sufficient
 - Proliferators will simply move to the locations with insufficient controls
- Only a small amount of material needs to be acquired for BW use
 - Bacteria and viruses can be amplified with commercially available equipment





General Motivations for Biosecurity

- **Increased regional terrorist activity may suggest that a country should pursue biosecurity**
 - **Assets could be at increased risk of theft and sabotage**
 - **Terrorists may be motivated by increasing ease and decreasing cost of producing and deploying a biological weapon and its potential impact**
- **Biosecurity has national benefits**
 - **Control of dangerous biological material**
- **Biosecurity implementation at a state or regional level would lead to increased international**
 - **Trust and transparency**
 - **Confidence among neighboring states**
 - **Influence international standards**



SE Asia Biosecurity Motivators

- **Many outbreaks of infectious diseases**
 - Result in many specimens of dangerous pathogens
- **Growing biotechnology industry**
 - Logical and cost effective to implement biosecurity for emerging bioscience activities
- **Large agriculture sector that is potentially vulnerable to bioterrorism**
 - ~25% GDP for India, Pakistan, Vietnam
 - ~12-18% GDP for Philippines, Indonesia, Malaysia
 - 60% of Indian workforce associated with agriculture
- **Increase in terrorist activity**
 - Groups such as Abu Sayyaf, al-Qaeda, Jemaah Islamiah
 - Incidents such as Bali bombings, Malaysian anthrax scare, recent attempts in the Philippines for a Madrid style attack
- **Some nations may present an opportunity to influence biosecurity for the region**

Growing Asia Biotechnology Sector

- **Malaysia: Biovalley - \$26 million investment**
- **Singapore: Biopolis Complex - \$500 million investment**
- **India: Biotech industry expects 15% yearly growth rate**
- **Indonesia: Three Inter-University Centers on Biotechnology**
- **Pakistan: Biotechnology a top priority, especially agricultural**
- **Vietnam: Developing 6 national Biotech labs by 2006**
- **Philippines: Developing a Bachelor of Science in Biotechnology**



Biopolis Complex

Research Capacity

- Many Southeast Asian countries have a large and talented scientific pool
- Numerous BSL-3 labs in the region
- India's National Institute of Biologicals
 - \$40 million to carry out research, clinical studies, and manufacturing
- Singapore's Biomedical Research Council
 - Funded at \$800 million per year

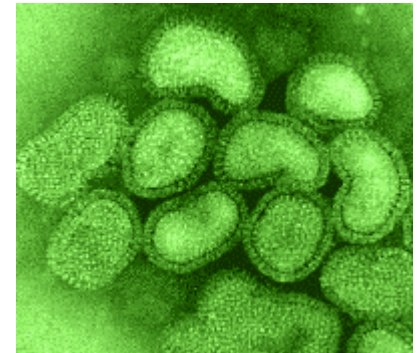


TB bacteria grown in
BSL3 lab



Biological Assets

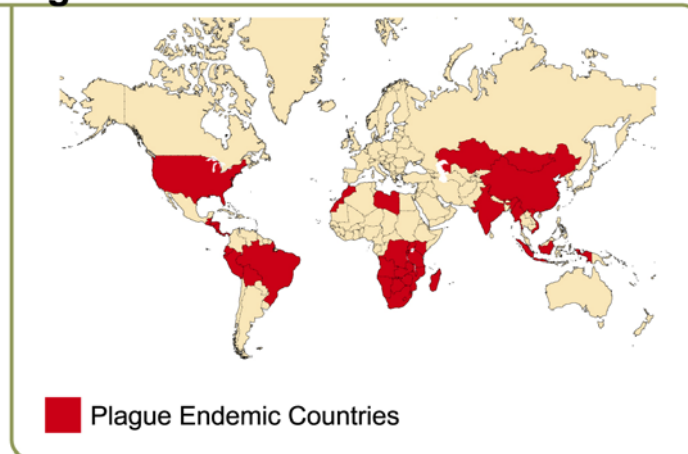
- Endemic diseases provide numerous specimens
- Culture collections
 - Asia has 158 registered collections containing 241,949 cultures
 - ◆ India – 15
 - ◆ Indonesia – 16
 - ◆ Malaysia – 5
 - ◆ Pakistan – 2
 - ◆ Philippines – 5
 - ◆ Singapore – 2
 - ◆ Thailand – 58
 - In comparison, the US has 19 registered collections



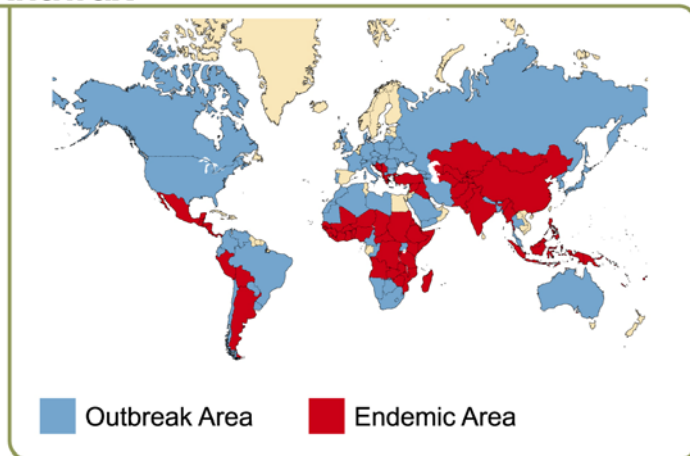
Avian influenza

Examples of Pathogens Endemic to Asia and Regulated in the US

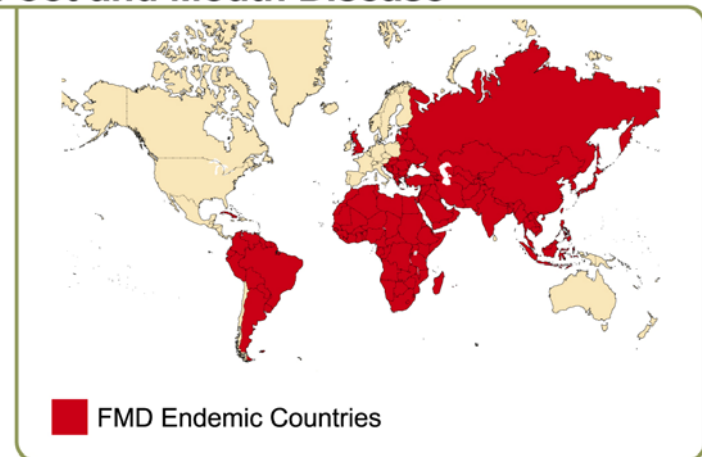
Plague



Anthrax



Foot and Mouth Disease





Conclusions and Future Directions

- **Southeast Asian countries have many reasons to be interested in pursuing biosecurity**
- **Individual nations should take responsibility for securing their dangerous pathogens and toxins**
 - **Scientists must be engaged in the development of biosecurity concepts**
- **Government support of biological R&D could be extended to aid implementation of biosecurity**
- **International biosecurity standards do not yet exist**
 - **Any efforts by SE Asia to implement biosecurity will influence the development of these standards**
 - **Biosecurity should be balanced with research needs**



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Acknowledgements:

Sandia Biosecurity Team: Ren Salerno, Natalie Barnett, Sue Rivera, Lauren Hickok, Daniel Estes, Susan Caskey, George Baldwin, John Milloy

www.biosecurity.sandia.gov